Germany's digital dividend
Transmission of television and internet via broadcast spectrum
The first analogue-digital switchover of terrestrial television transmission – five years on

mabb_

Contents

LG Touch DVB

Experiences and perspectives of the first analogue-digital switchover of terrestrial television transmission world-wide – five years on

On 4 August 2003, analogue terrestrial TV transmission in Berlin was switched off completely. With this act, the first switchover world-wide was concluded.

Other German regions followed the Berlin example: Commercial television ceased analogue terrestrial transmission in 2005, and the last public-service broadcasts transmitted over analogue capacities will stop at the end of 2008.

The switchover not only ensured competitiveness for terrestrial transmission, thereby in fact preserving it – it also paved the way for new developments: In Berlin, the first digital dividend was achieved, and the resulting frequency was allocated for mobile TV via DVB-H. In Brandenburg, broadcast frequencies are deployed for the provision of broadband internet for the first time, starting with a pilot project.

mabb, the regulator for commercial broadcasting in Berlin and Brandenburg, has been consistently pursuing the same objective: Taking up the opportunities provided by digital technology to serve the interests of consumers, and initiating new developments.

Broadband internet cannot be classified as broadcasting in the traditional sense, nor as typical telecommunication. The use of spectrum presents one of the key issues awaiting a solution in the future. Here, differing interests face each other, and it is no longer just those concerning the broadcasting sector, but also those relating to the mobile industry and to internet access.

In the analogue-digital switchover process conducted in Berlin, mabb helped to secure a reasonable balance of interests of the various parties, thus opening a way which gives credit to the specific conditions of the unique German TV market. Concerning the digital dividend, Germany has to face up to an even greater challenge: finding a German way which can accommodate European and global developments, but is at the same time tailor-made to suit the special situation of Europe's largest media and telecommunications market.

The following review and analysis of the switchover also looks ahead towards a concept for the use of the digital dividend in Germany, and hopes to contribute to its realisation.

Dr. Hans Hege


MEDIAMASTER 9820 T

Digital terrestrial television – switchover and further perspectives

"I am more than relieved that no-one took me up on the bet I offered at the start of the Berlin-Brandenburg pilot project so I didn't lose it. I would have put a lot of money on it … going wrong.

That no-one set a higher sum was not due to the fact that I was considered an outsider, but simply because people simply agreed it would go wrong. …

This idea to say we will really switch off, … that was really courageous … Who would not have put their money on the example of just one poor old lady being enough for the yellow press to make a meal of things for at least three weeks. But: Nothing has happened. Absolutely fascinating …

It wasn't just courage, it was a lot of really hard work and good planning which surprisingly turned out a success".

quote Prof. Dr. Axel Zerdick at the 2003 Media Forum Berlin

Concept and process of the switchover in Berlin-Brandenburg

In 1998, the Digital Broadcasting Initiative which was led by Federal Government and tied in the German states, broadcasters and the industry had earmarked the year 2010 as the deadline for switching broadcast transmission to digital technology. At the time, experts expected radio to go digital via DAB, while regarding terrestrial television, the results of the 2006 Regional Radiocommunication Conference (RRC-06) which was to decide anew the coordination of frequencies for Europe were seen as the yardstick along which the route to take would be determined.

The analysis conducted by mabb, the regulator in charge of the allocation of broadcast spectrum in the German states of Berlin and Brandenburg, resulted in different conclusions. Terrestrial transmission had fostered the breakthrough of commercial television in Germany, and it also played a major role during the coordination of frequencies following German re-unification. Thereafter, however, the number of terrestrial households experienced a sharp downturn in the following decade, slumping from 60 per cent in 1992 to less than 10 per cent in 2002.

But even under the comparatively beneficial conditions in Berlin, the additional frequency spectrum available was not sufficient to provide a range of services attractive enough to entice consumers to invest in the necessary receivers. mabb did not consider it prudent to repeat the mistakes made during the introduction of regular DAB services.

Switching off analogue transmission without testing DTT as an alternative would have been perceived as enforced provision of TV via cable and was not acceptable from a political point of view. Not doing anything at all would effectively have been a decision against terrestrial TV as it was evident that the economic basis for terrestrial TV was dwindling away. No-one knew whether digital terrestrial transmission would be accepted by a sufficiently large number of viewers. mabb advocated a decision by the audience and a market test.

The concept for switchover was based on giving up analogue transmission as only analogue switch-off would free up the transmission capacities required for a sufficiently large number of digital services and good reception. GARV, a subsidiary of mabb, developed a concept for the deployment of the capacities which was coordinated with the Regulatory Authority for Telecommunications and Posts (RegTP).

In order to receive the enlarged range of services available via DTT, however, consumers needed an additional receiver (set-top box). Subsidising receivers in the way in which pay-TV or mobile telephony had been financially helped along was out of the question; DTT in Germany had to be based on free-to-air reception. The set-top boxes marketed internationally had to be adapted to include the VHF range, but they could benefit from falling prices and the synergies resulting from the world-wide use of DTT and DVB via cable and satellite. The market analysis and the discussions with the receiver industry convinced mabb and the broadcasters that the price for the cheapest set-top boxes would drop below € 200. For the comparatively small market in Berlin-Brandenburg, however, it was not possible to set binding specifications as had been the rule in other countries of Europe. The risk therefore remained whether terrestrial households which were assumed to be not too technology-minded would be able to cope with digital technology.

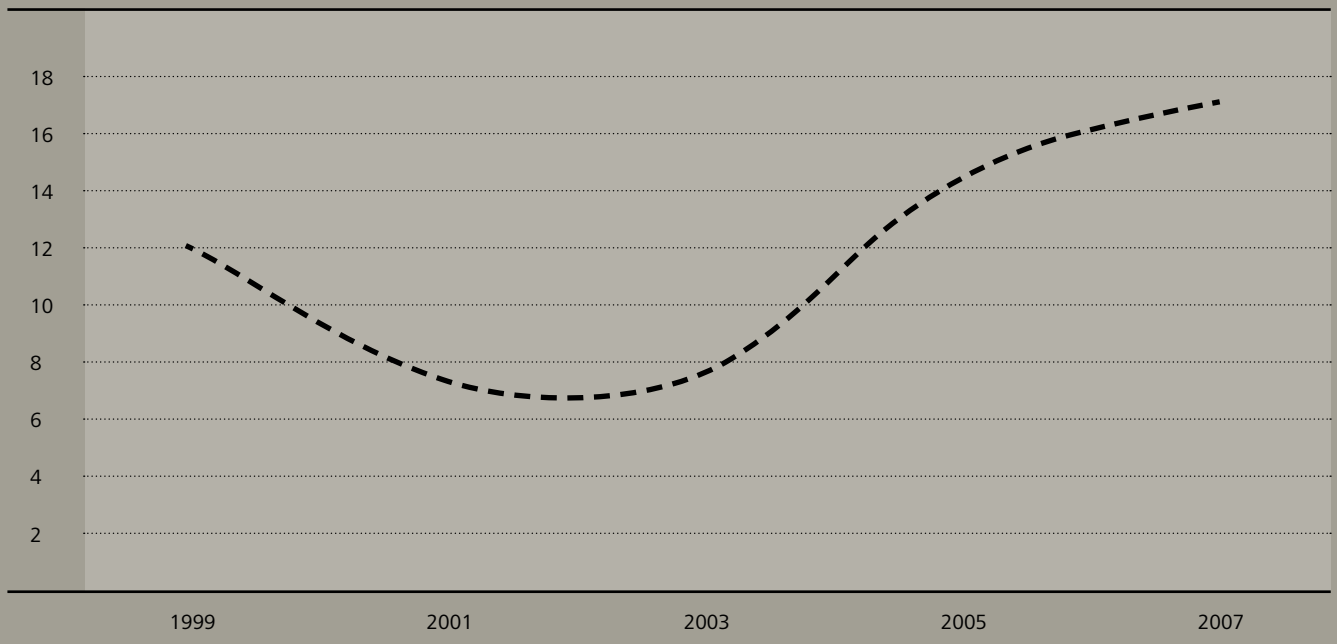
The states of Berlin and Brandenburg amended the Interstate Media Treaty for Berlin and Brandenburg, thereby providing mabb with the legal scope for regulating analogue-digital switchover. In the Interstate Broadcasting Treaty, the obligation of public-service broadcasting to provide services via analogue transmission was waived but no provision was included in the Treaty regarding the time and terms for ending analogue transmission.

Switching off analogue transmission became possible only by coordinating the interests of public-service and commercial broadcasters. Both were interested in an independent route of transmission and wanted to keep all options for the future use of transmission capacities open, irrespectively of how they might look. At the time, this was not yet very clear.

mabb could convince all broadcasters to dare switchover in Berlin-Brandenburg, thus gathering experience regarding the future use of terrestrial transmission capacities with a limited risk only. On 13 February 2002, an agreement was signed which set out the key terms of switchover:

DTT take-up

Households, in per cent



Source: mabb, based on AGF/GfK and GSDZ data

In a staged process, the first digital channels started broadcasting via a high-power transmitter from October 2002 onwards, providing consumers with a basis for their purchase decision. Switch-off of all commercial analogue channels and moving the public-service services to lower-power transmitters on 28 February 2003 presented the greatest challenge. These were also finally switched off on 4 August 2003.

The broadcasters and mabb developed a joint communication strategy designed to inform the affected households about switch-off without causing confusion among cable and satellite homes which remained unaffected by the switchover. The communication was devised in a technology-neutral way; it aimed at informing consumers about switch-off and the various options available with all their respective advantages and drawbacks, rather than at inviting viewers to switch from analogue to digital terrestrial transmission.

The main outlet for communication was presented by the channels themselves while the most cost-intensive measure was a letter sent out in February 2003 to all households in which the director of mabb informed households of the pending switch-off. mabb also closely liaised with tenants' associations and consumer interest groups. The cost for the communication initiatives amounted to € 1.1 million and was borne jointly by the broadcasters and mabb.

Cable and SMATV systems which until then had taken up the TV channels with the highest reach in analogue mode, modulating them for redistribution in the cable networks had to be re-aligned at the expense of the systems operators.

To help the financially less-well-off viewers with switchover in a socially acceptable way, a solution was developed for households entitled to the use of a TV set under the German social benefits system. Together with an institution of the welfare organisations, the acquisition of set-top boxes and their distribution was organised. For this support which was claimed by some 6.000 households mabb spent € 732.000,-

The concept also included support for the commercial broadcasters to cover around one third of the transmission costs, thus partly balancing the additional financial burden resulting from their obligation to transmit their channels via DTT for a minimum five years, irrespective of the acceptance of DTT. In this way, consumers were provided with a clear perspective regarding their purchase decisions. mabb set aside € 4.2 million for this purpose.

The spectrum freed up as a result of analogue switch-off allowed further commercial and public-service services to go on air. In the commercial sector, all applicants prepared to foot the costs of terrestrial transmission could thus be awarded transmission capacities. While in analogue transmission, a mere 12 services had been available, their number rose to 25 with transmission via DTT.

How consumers would react to switch-off was completely uncertain. And although only some 250.000 of the 1.8 TV households in the region were affected by the switchover, protest could have been considerable, especially if the popular press had taken the issue up in a negative vein. The sentiments at the time are reflected in the quote by media expert Axel Zerdick (see box).

mabb and the broadcasters had assumed that switchover would convince consumers in the medium term. How positively it was received in the event and how few consumers actually protested, however, took everyone by surprise. The number of households acquiring a set-top box exceeded forecasts. And while around a third of terrestrial households switched to cable reception at the invitation of cable operators, cable households in return made use of the opportunity to take up terrestrial reception. Their number increased with second and third sets when the prices for receivers went down. This is all the more remarkable as around 80 per cent of households in Berlin receive TV via cable, with more than half of homes settling the cable fee with the rent.

Since switchover, the number of terrestrial households has started to go up again, as the figures for terrestrial reception in Berlin-Brandenburg listed in the digitisation reports of the German regulators prove.

Clixxun Vube Alpha

Developments in Germany since the switchover

Both the television broadcasters and the other regions in Germany took a keen interest in the developments in Berlin-Brandenburg. As feared protests did not come and acceptance of DTT exceeded expectations, agreements for switchover were taken out for other regions involving both public-service and commercial service providers.

They followed the model developed in Berlin-Brandenburg and built on the savings the commercial broadcasters achieved as a result of the switch-off of analogue transmission. The communication strategy adopted in Berlin was also taken over.

Unlike in Berlin-Brandenburg, an additional incentive was developed in some regions for commercial broadcasters by granting them a preferential position in the analogue cable networks in return for their participating in switchover to DTT.

The number of homes passed and homes connected to DTT went up.

The prices for set-top boxes went down in line with market developments. Under the extended transmission, mobile and portable reception via portable LCD sets, PCMCIA cards and USB sticks developed.

The commercial broadcasters in switchover concentrated their DTT distribution mostly in the urban areas including those regions where they could achieve savings as a result of analogue switch-off.

No switchover was effected in some densely populated areas such as Leipzig-Halle or Stuttgart where analogue terrestrial transmission of commercial TV had already stopped before and the broadcasters only faced additional costs without any corresponding benefit.

Public-service broadcasting, on the other hand, could achieve considerable savings by going digital. The expenditure incurred in supplying all areas with a minimum of 100 viewers with terrestrial TV which had been covered through a surcharge in the licence fee could be saved; supply requirements were cut back to 90–95 per cent of households. Switching off filler stations and closing down transmitters cut transmission costs for public-service broadcasting by around half (estimate).

The situation is not, however, the same for ARD and ZDF respectively. ZDF could limit transmission to the major urban areas as do the commercial broadcasters, thus economising even further on transmission costs. ARD, on the other hand, operates its own transmitter network and therefore has a vested interest in maintaining its transmission infrastructure.

In rural areas, DTT is as a rule available for stationary reception via a roof antenna. The benefits of mobile reception and portable indoor reception of the public-service channels are also concentrated on the densely populated areas.

The digitisation reports of the German regulators show the assumed result: Acceptance for DTT in regions where commercial channels are not available via DTT is clearly lower.

Switchover agreements and DTT roll-out in the various regions

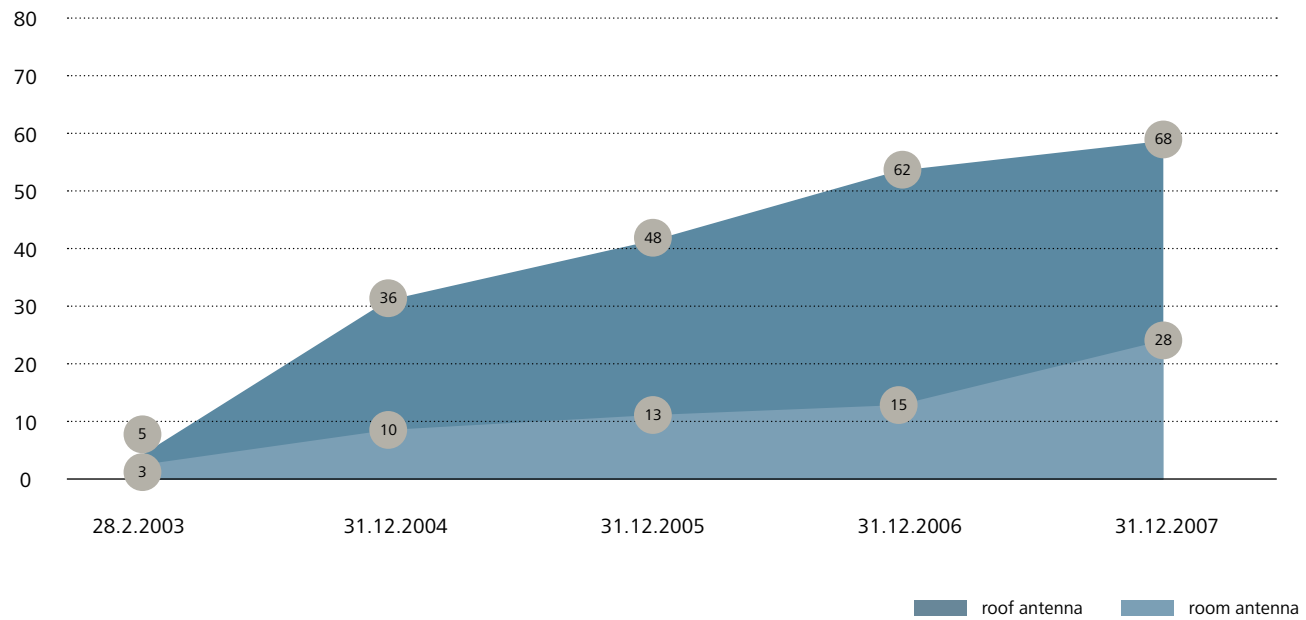
February 2003	**Switchover agreement Berlin-Brandenburg**	public-service and commercial
February 2003	Berlin / Potsdam	
October 2003	**Switchover agreements Northern states and Northrhine-Westphalia**	
March 2004	**Switchover agreements Hesse, Rhineland-Palatinate, Baden-Wuerttemberg**	
May 2004	Hanover / Bremen / Brunswick	
	Cologne / Bonn	
May 2004	**Switchover agreements Bavaria and central Germany**	
October 2004	Rhine-Main region	
November 2004	Hamburg / Lübeck / Kiel / Schleswig	
	Duesseldorf / Ruhr area	
May 2005	Munich / Nuremberg / Southern Bavaria	

December 2005	Halle / Leipzig	public-service
	Erfurt / Weimar	
	Mecklenburg-Western Pomerania, Lingen / Osnabrueck	
May 2006	Stuttgart / Heidelberg / Kaiserslautern	
	Aurich / Bielefeld	
	Goettingen/Kassel	
	Wuerzburg, Lower Franconia, Eastern Westphalia-Lippe, Wuppertal, Weserbergland	
October 2006	Schleswig-Holstein-West coast	
December 2006	Eastern Bavaria	
	Frankfurt (Oder) / Cottbus	
June 2007	regions of Muenster, Dresden / Eastern Saxony, Chemnitz, Saxon Vogtland, Gera / Thuringian Vogtland	
July 2007	Upper Rhine area, Southern Upper Rhine area	
October 2007	Harz, Magdeburg / Southern Altmark, Wittenberg	
November 2007	Aachen, Lake Constance – Upper Swabia, Neckar Alb, Swabia (Bavaria)	
December 2007	Baden-Baden / central Upeer Thine, Palatinate / Donnersbergkreis, Anterior Palatinate, Saarland	
June / July 2008	roll-out Saxony-Anhalt (North) / Thuringia (West)	
August 2008	Ahrweiler / Koblenz	
end-2008	Trier / Bamberg / Aalen / Pforzheim	

Sources: DTT Task Force, MEDIA BROADCAST, mabb

DTT technical reach in Germany

no. of citizens reached, in million



Source: MEDIA BROADCAST

Pace Digital TV Adapter

Germany and the situation elsewhere

Switchover in Germany was not driven by the ambition of making spectrum available for other applications. It thus differs considerably from the approach adopted in the USA or in the United Kingdom.

Switchover in Berlin was abrupt without an extended simulcast period. The rationale behind this strategy was that DTT would be accepted by consumers only if analogue transmission was discontinued. Frequency capacities did not allow for parallel operation, and broadcasters would not have been prepared to shoulder the burden of both analogue and digital transmission for only a small number of households. In 2002, mabb asked broadcasters to chose between doing without terrestrial television altogether in the medium term, or to dare switchover at short notice.

With this approach, mabb banked on the interest of broadcasters in continued control over a route of transmission which would secure a better negotiating position vis-à-vis the cable and satellite operators. At the time, Liberty Media was attempting to take over the German cable infrastructure. The company also had a vested interest in the provision of contents.

Compared to the situation elsewhere, the terrestrial infrastructure in Germany is characterised by the strong position held by the established content providers. There is only a limited number of channels for services available while transmission costs are comparatively high, thus being of interest only for channels with a wide audience reach. Digitisation of the cable networks was pursued with less energy by the major TV providers as it would potentially enlarge competition.

For extending the range of services available via digital transmission, Germany was in the comparatively comfortable position of being able to draw on available services which were funded via the licence fee and/or advertising revenues and could now also be made available via DTT. Satellite TV in Germany is devised largely for free-to-view reception, and this model could be transferred to terrestrial transmission: Consumers only pay for the receiver, but do not have to pay continuously to receive specific channels.

Because of the attractive range of free-to-air services in Germany, there was no need to develop additional MHP applications as happened in Austria; they also did not meet with great acceptance via cable and satellite. For this reason, there were and are no subsidies for such services in Germany.

The biggest question mark, however, concerned the issue whether or not switch-off of analogue transmission would be accepted. At the beginning, prices for set-top boxes were still in excess of € 200 and there was no experience available in this respect from anywhere. While there was some willingness to introduce a legal provision for switch-off in the political debate, no-one wanted to take over responsibility.

Switchover scenarios involving politics have shown repeatedly that politicians are only very rarely willing to take great risks regarding switchover, especially because of their concern to lose votes. And even if only a small number of households is affected, such as, for instance, the homes still depending on analogue TV reception in the UK today, problems are seen especially concerning the elderly or socially disadvantaged members of society.

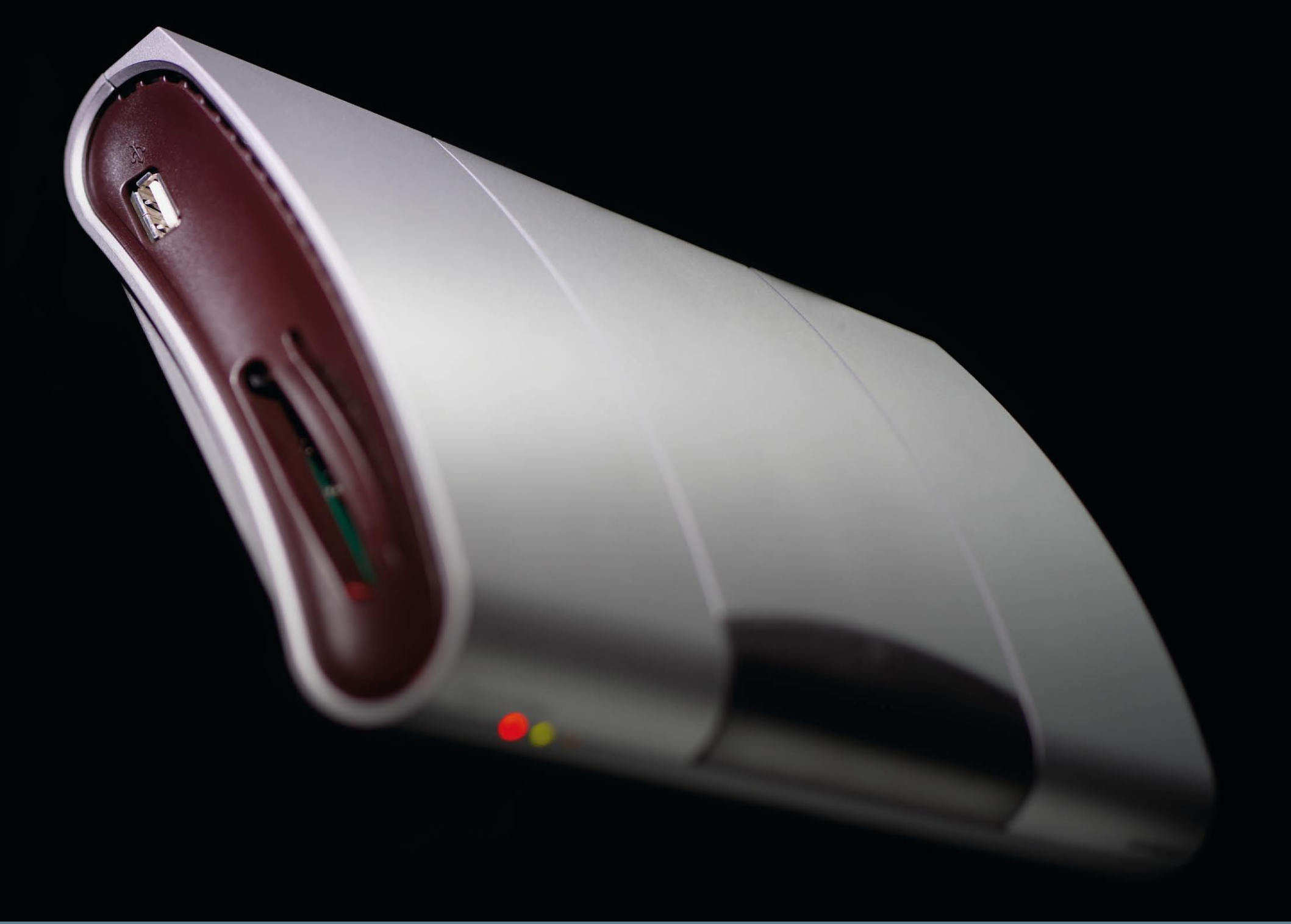
In Berlin, mabb as a prerequisite for switchover took on responsibility and won the support of the major television providers. Their risk was limited as they did not have to worry about major losses in audience reach while they gained the opportunity to gather experience for their future strategies in Germany overall.

The "region by region" pioneered in Berlin has since been adopted everywhere and could also bank on an advantage of the Federal system, namely innovation in competition among the German states, rather than having to contend with the smallest common denominator which usually has to be accepted for joint solutions tying in all parties.

The most important experience in Berlin in the long run was the message that switch-off is possible provided consumers are presented with a clear and logical concept and corresponding added benefits.

This communication concept required only limited expense. Credibility presented a core issue. For digital cable and satellite television, far more expensive communication strategies devised later achieved far less success.

Social acceptability of switchover was a key point in the concept, but here, too, expenditure was limited by comparison



to other countries. Due to the continued reduction in the prices for set-top boxes it was not necessary to continue this support in other regions of Germany.

A comparison with the plans in the UK shows an interesting picture regarding the expenditure incurred for switchover. For communication measures, some GBP 200 million (€ 250 million) were provided while support for households exceeds GBP 600 million (€ 725 million). As starting conditions are largely similar with less than 10 per cent of analogue homes affected at the time of switch-off, the rate of support available per household in the UK is considerably larger than in Germany.

It was clear from the outset that the set-top boxes would not be generally subsidised; in this respect, the approach adopted in the USA differed. No promotion for set-top boxes as adopted in Austria appeared to be necessary.

A German specificity was the role of the network operator, a subsidiary of Deutsche Telekom AG. Switchover was agreed by mabb with the broadcasters without involving the network operator. For switchover to digital transmission, the licences for the network operation had to be tendered anew. The difficult task of switching the transmitter network was achieved in an exemplary fashion but the role played by the network operator concerning communication and the distribution of receivers in no way compares to the efforts undertaken by the cable or satellite providers for their respective infrastructure.

Unlike in other European countries which subsequently adopted national strategies for switchover, in Germany it was certainly unclear whether the market test conducted in Berlin would work and whether other regions would follow. There was no national concept underpinning switchover. The decisions to switch over were taken elsewhere only after the successful pilot in Berlin. There was – and to this day still is – no overall national plan.

Funding switchover and the dispute with the EU Commission

For switchover to become a success, it was essential to secure the participation of both public-service and commercial broadcasters in switch-off, and, linked to it, the supply of an extended range of digital services which would be available for a reasonable period of time. No-one could know in advance how DTT would be accepted. For investing € 200 in a set-top box, however, consumers had to be reasonably confident that they would be able to watch the services promised via DTT for a minimum period of five years. Care had to be taken therefore that DTT transmission would continue even in a situation in which it turned out not to be economically viable.

The commercial broadcasters saved costs by switching from analogue to digital terrestrial transmission in comparison to the costs incurred for transmitting the individual services. However, they also had the option to forego terrestrial transmission altogether without really suffering any major losses in audience reach, as the households affected would have switched to cable or satellite reception which already dominate reception. When switchover in Berlin was organised, DTT was no success anywhere in Europe, and the business models developed by commercial broadcasting at the time already focussed on those routes of transmission the cost of which they would not have to cover entirely on their own, meaning, in particular, cable transmission.

The broadcast groups would not have been prepared to participate in switchover and to agree to transmit their major channels via DTT for a period of five years without a financial incentive. From their point of view, the obvious strategy would have been to wait and see.

mabb therefore took out agreements under which the commercial broadcasters would be relieved of part of the transmission expenditure (approx. one third) for a period of five years. The same terms were offered to all other broadcasters opting for DTT in order to avoid a distortion of competition among broadcasters.

The German states which are in charge of such issues did not notify the switchover concept with the European Commission as they held the view at the time that the use of licence fee funds (from which the regulatory authorities are also financed) is not covered by the state aid provisions of the European Commission.

Acting upon a complaint filed by ANGA, an association of cable network operators, the European Commission opened a formal inquiry and eventually ruled the funding granted to commercial broadcasting to be illegal. In accordance with this decision, mabb claimed back the funding which had amounted to € 2.2 million. The Commission, while acknowledging that switchover can be supported with some measures, took the view that the commercial broadcasters would have been prepared to take up digital terrestrial transmission even without subsidies, and further argued that other requirements for granting state aid had not been met.

The German Government, mabb and the commercial broadcasters have taken the case to the European Court of First Instance; it is still pending.

For the continued progress of analogue-digital switchover, the case is no longer of major relevance. The success of the Berlin switchover allowed all other regions to switch over without any subsidies being paid. The major broadcasters in Berlin continued transmission even though their legal obligation to do so had been suspended. mabb, on the other hand, is still required to limit financial consequences for the broadcasters under the agreements.

Furthermore, the decision of the EU Commission raises a number of fundamental issues as it neither acknowledges the specific role held by terrestrial transmission (which has meanwhile become clearly evident in the debate about the digital dividend), nor the public remit of the commercial broadcasters whose provision of services not only has an economic function, but also holds elementary implications for the dual broadcasting system as a whole.

In retrospect it can be concluded that switchover in Berlin and Brandenburg was possible only as it was not made dependent on a decision by the European Commission. The EU communications on analogue-digital switchover were issued long after the switchover in Berlin-Brandenburg had been carried out. And precisely because there was no previous experience to draw on and no comparable case law from other state-aid cases, fully-fledged state-aid proceedings would have taken up so much time that switchover could not have been realised. At the latest after the insolvency of the Kirch Group in April 2002, a mere two months after the start of switchover in Berlin, the opportunity to take out the agreements on switchover would have been irretrievably lost.

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Digitisation of television infrastructures – a comparison

Terrestrial transmission in Germany has made it to digital a long time before the year 2010 which had originally been envisaged, and also considerably in advance of the European target 2012. By comparison, cable and satellite are lagging behind.

There is no standard way to digitisation, and public interest can also differ widely. Politics concentrate on terrestrial transmission as it will reap a digital dividend which can then be shared out. While there is a general interest in developing new economic value via new channels becoming available as a result of digitisation, the dominating interest of network operators and broadcasters is concentrated on opening up new sources of revenue.

Terrestrial transmission offered and still benefits from the fact that unlike cable or satellite, there could not be any simulcast transmission, and that consumers could be convinced that the new services were available only at the expense of giving up the old route of transmission. A strategy as adopted in the UK with a wide range of digital services complementing analogue supply will make switch-off rather hard even when digital supply reaches 90 per cent.

DTT in Germany could build on an existing range of services which was already familiar to consumers through cable and satellite distribution. As a result, the typical hen-and-egg problem did not arise under which digital services are attractive only due to additional services while it proves difficult for providers especially in the starting phase to offer a range of services attractive enough for consumers to invest in the cost for digital receivers either by buying or by hiring them.

While cable or satellite can offer a larger range of digital services, including all regional programmes of ARD and all ARD radio channels as well as additional advertising-funded services which would not find transmission capacity in the analogue cable with its limited spectrum, this added benefit does not really convince consumers. Vice-versa it is difficult for broadcasters to develop new contents competing against the attractive services available already which would be refunded through only a limited part of the television audience.

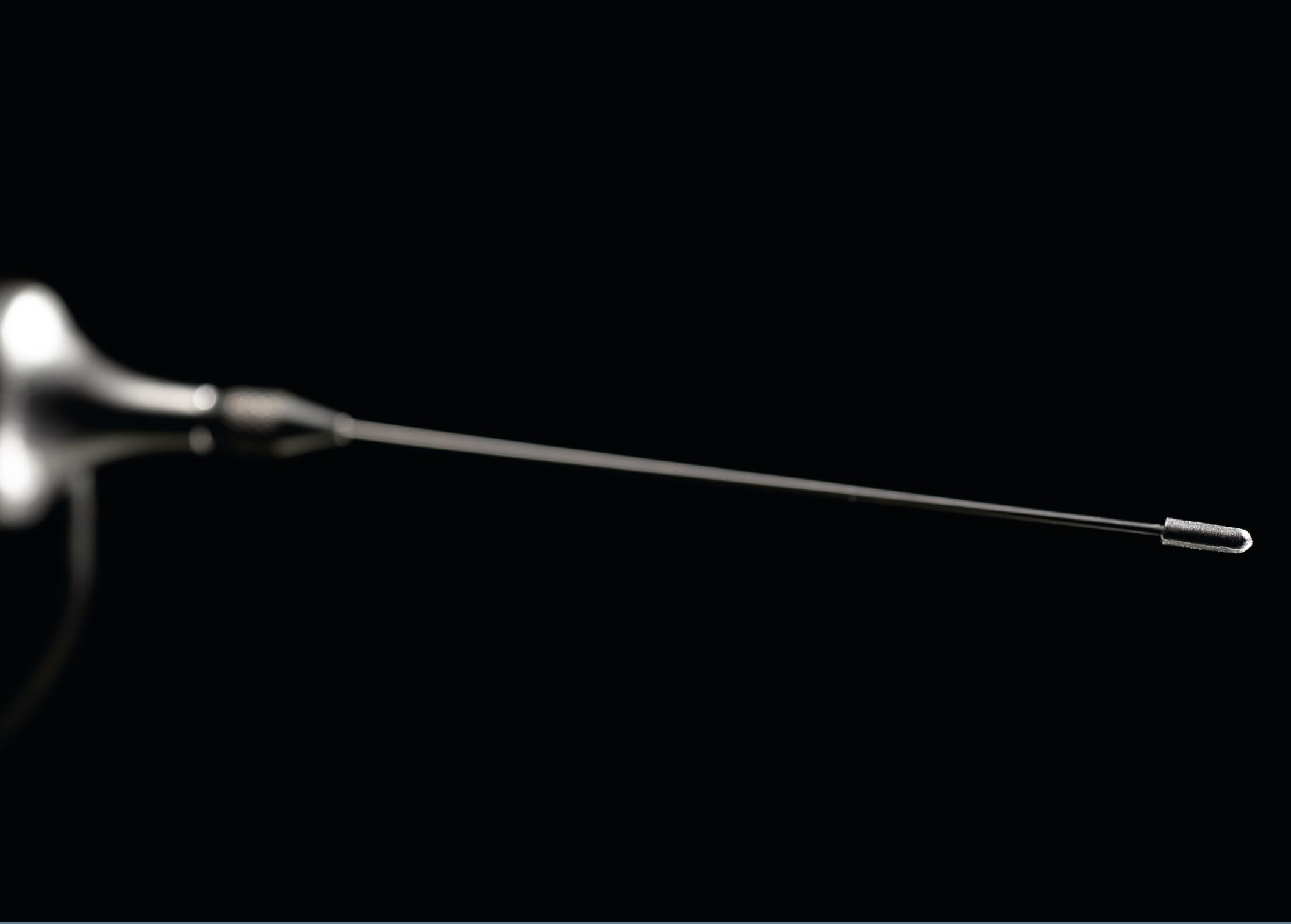
The interest of network operators and content providers in developing new business models for the digital era to generate additional income is understandable, but at the same time presents the core of the problem: Consumers are not interested in helping the industry to make more profit, but rather decide according to their own criteria and benefits.

It was to be expected that operators planning to charge extra for services which had been available via analogue transmission already would come up against specific difficulties in this respect. But this did not prevent the major commercial broadcasting groups or the pioneers of mobile TV from devising new business models based on this very approach. The idea of basic encryption of commercial TV channels and refunding both encryption costs and part of the programme investments via additional revenue was understandable from a strategic point of view; it was hardly, however, suited to demonstrate the added value of digitisation to consumers.

Satellite TV and subsequently DTT in Germany are based on a concept under which consumers would purchase receivers but in return would no longer have to pay the cable fee. This could not be changed despite considerable planning and communication efforts on the part of ASTRA and the major TV groups trying to convince viewers of the new model.

Neither the cost incurred in purchasing a digital receiver nor the discomfort of fitting each TV set with its own set-top box presented a major obstacle, as the introduction of DTT has proven. Consumers would not, however, consider it an advantage for them if – unlike with analogue cable – they would have to pay regular cable fees for additional receivers and if reception of digital services cost more than analogue supply.

The major cable operators are now concentrating their investments on the development of broadband internet and the related marketing which appears to be more convincing than the marketing of digital TV. Unlike in an early phase of the USA cable industry, there is no major investment in programme development, nor is distribution of addressable boxes subsidised in any major form as planned by John Malone (Liberty Media) some years ago. As a result, cable will continue to lag behind satellite. Regarding satellite, the added benefit regarding contents is also limited, but satellite viewers are used to additional receivers and do not have to pay extra for receiving the advertising-funded commercial channels.



Technisat rod aerial

It would be up to the television broadcasters to agree on a date for the switch-off of analogue satellite transmission; after all, more than 60 per cent of households receive their satellite TV in digital mode. And even if the added value does not convince every consumer, the barrier for transition would be low and the broadcasters could save considerable sums of money. It would be possible to develop a joint communication strategy along the example of the DTT switchover.

At present, however, such an agreement is not in sight as the plans for basic satellite encryption have not yet been buried and the resulting confusion as to whether reception via digital satellite will incur additional costs for the reception of commercial channels persists. Some time ago, the German regulators suggested that the private broadcasters explicitly do without this additional funding for their main services (notwithstanding any surcharge for HDTV). As long as this step is not taken, neither the regulators nor politics will support switch-off of analogue satellite TV according to the pattern of DTT as neither side can be interested in pursuing any strategy at the expense of consumer interests. And the fact that SES ASTRA earns good money from analogue transmission also plays some role.

The cable operators are unwilling to participate in digital switchover projects, even if it is only pilots, as long as they have to contend with irritation on the part of their customers. The housing industry has taken on the role of controller on behalf of consumers. And the process of digitisation was not made any easier by the broadcasting groups either as they receive an additional fee for agreeing to simulcast transmission of their services. Furthermore, each TV set can receive analogue cable TV whereas there are no agreements concerning digital reception as yet which would provide the necessary transparency and certainty for viewers that investing in a new set is safe and future-proof.

Even viewers receiving analogue services can benefit from the advantages of digital storage. DVD recorders and hard-disk storage media are now in wide supply. If features which consumers enjoyed as attractive in the analogue world are taken away as a result of the introduction of a rights management for digital transmission and encryption, viewers will hardly take this to present progress or added value. “Added digital value”, however, is a absolute condition for the often-quoted “market-driven” analogue-digital switchover.

The Digital Broadcasting Initiative and subsequently the Forum Digital Media which is organised by the Federal Ministry of Economics and Technology and the German states continues to debate switchover with the entire industry and the trade associations. The Forum, although useful regarding communication on DTT switchover, showed that it operates on the basis of the smallest common denominator only and mainly serves for proclamations or rather general declarations which only rarely reflect the true interests of the majority of participants.

Consumers and their interests as the core function presented the basis for the switchover of terrestrial TV transmission. A breakthrough for digitisation can therefore only be expected once this is also taken into account for all other routes of transmission.

But even if there are no viable concepts for analogue-digital switchover of cable and satellite, this will not stop digitisation in general. In that case, digital will simply find other routes: a great variety of new contents and social networks in broadband internet.

DTT regions in Germany

Source: www.ueberallfernsehen.de

Open issues for the future

Centres of DTT distribution

Switchover involving commercial broadcasters has been centred on the major urban areas while the regions of Leipzig-Halle and Stuttgart are not supplied with commercial services via DTT.

Public-service broadcasting scaled back its supply target to around 90–95 per cent of households. The concept developed by ARD and ZDF is based on these target figures and provides for reduced terrestrial supply, also restricting portable and mobile reception to the major centres of population.

Limited acceptance of DTT in regions where commercial services are not transmitted via DTT will in the medium term result in the question whether licence fee payers who form a community based on solidarity can be expected to fund a very limited number of homes being supplied at considerable cost per viewer although these could be provided with TV services via satellite at considerably less expense. From a strategic point of view, terrestrial transmission could also be preserved in a mode under which the provision of public-service broadcasting is concentrated on urban areas in the same way in which this is the case for commercial TV.

The capacities employed for the DTT provision of public-service contents in rural areas also present a spectrum reserve which might be put to use for internet supply via broadcast frequencies. And the more successful this supply develops, the more pressing the question of a review of priorities will become.

Business models and funding

To date, DTT in Germany has been developed exclusively on the basis of free TV. Premiere in the end did not follow through with initial plans of also participating in DTT transmission. Regarding marketing, no attempt was started in Germany for the development of a marketing platform for DTT which even in the case of cable and satellite achieved only limited success.

The commercial sector will critically review a model which requires it to cover the entire costs of transmission if transport expenditure for other infrastructures goes down and revenues could even be scored. It was therefore only logical to link considerations for the basic encryption of commercial services transmitted via satellite to a similar approach for terrestrial transmission.

Business models for commercial mobile TV hold the attraction of addressable receivers. This means that it is no longer the service providers who pay for transmission but consumers, and new sources of revenue can be opened up for the broadcasters. This option is now, however, challenged by the fact that DTT transmission also permits reception on mobile handhelds.

In the medium term, platforms for cable and satellite transmission are likely to develop further with the majority of contents available only against pay. The fact that live reports of Bundesliga football matches are not available via DTT at present is already putting the system at a disadvantage compared to arrangements in Italy where matches can be subscribed to individually.

However, addressability and the reception of programmes against pay are features which are also essential for terrestrial transmission, raising the same key issue of consumer-friendly arrangements without added costs being charged for services that are available already.

The set-top boxes introduced in Germany do not feature addressability; this means that new boxes would be needed if consumers wanted to receive additional contents. In this context, the issue of a more efficient encoding technology could also be tackled.

Terrestrial transmission as a public remit

Transmission of television contents via terrestrial capacities is the only means by which the legislator can guarantee television being provided for the people at terms also taking into consideration the less advantaged members of society. In the competition of transmission infrastructures, terrestrial transmission has an essential role to play irrespective of the fact that it reaches only a small part of the population and cannot offer such a wide range of services as cable, satellite or IP-TV. Switching to terrestrial transmission presents a good strategy capable of countering the potential risk of a dominant market position of the other routes of transmission being abused. In view of the encryption plans developed by the commercial broadcasters, the legislator must be increasingly

interested in preserving terrestrial transmission as a route for the reception of a minimum supply of free TV. However, this means that terrestrial transmission must be awarded a special role among transmission infrastructures. The scope and funding available in this respect will also be determined by the outcome of the current legal dispute between Germany and the EU Commission. In the controversy surrounding DTT switchover in Berlin, Brussels did not recognise the special role played by terrestrial transmission, insisting instead on "technology neutrality".

DTT 2.0 – more efficient encoding

Progress of DTT and encoding technology would allow for a greater number of channels to be transmitted via the same frequency spectrum. However, this would require consumers to obtain a new receiver. Analogue-digital switchover is thus followed by the challenge of a future digital-digital switchover which also raises the issue of the added value for the consumer again.

By comparison, providing additional contents via a more efficient encoding technology would present fewer problems; they could in particular include pay-TV services as well as commercial contents funded via advertising which are distributed in regions in which they are not yet provided via DTT. Costs for receivers will, however, initially be considerably higher while audience reach has to be built up from scratch again.

The international debate is focussing on whether MPEG 4 is to be used on its own as the more efficient encoding system (e.g. in France), or whether it is better to wait for the new version of DTT, namely DTT-2 (this is the concept developed by Ofcom for the UK). The key issue here, too, is receivers being available to consumers at a reasonable price.

In view of the high market penetration of DTT receivers, a change of transmission technology of the services already on air via DTT could be problematic as long as the price of the set-top boxes needed for reception in the new technology exceeds the cost of sets on offer in the mass market today by a considerable margin.

Simulcast transmission would require additional spectrum. Unlike in the UK, Germany would face more or less the same problem as during the first switchover in this respect. The UK can utilise more efficient technologies in the spectrum becoming available as a result of switch-off, i.e. part of the digital dividend, while in Germany, the digital spectrum already in use would have to be employed, resulting in a second "hard" switchover at least in the medium term.

For such a step, no sufficiently large added value appears to be in sight at present. HDTV which in other countries is also transmitted via DTT, would take up such an amount of spectrum and also cause considerable expense to the small number of households receiving television via DTT, that there would not be a reasonable balance between the added value and the disadvantages incurred in binding capacities for this type of transmission. Additional contents currently do not offer sufficient incentive in this respect.

But it could make sense all the same to agree on a receiver specification allowing for a more efficient encoding system in order to open up future perspectives. If development of receivers is sufficiently advanced to allow for market introduction on the one hand, and additional contents are made available on the other hand, this would permit another hard switchover.

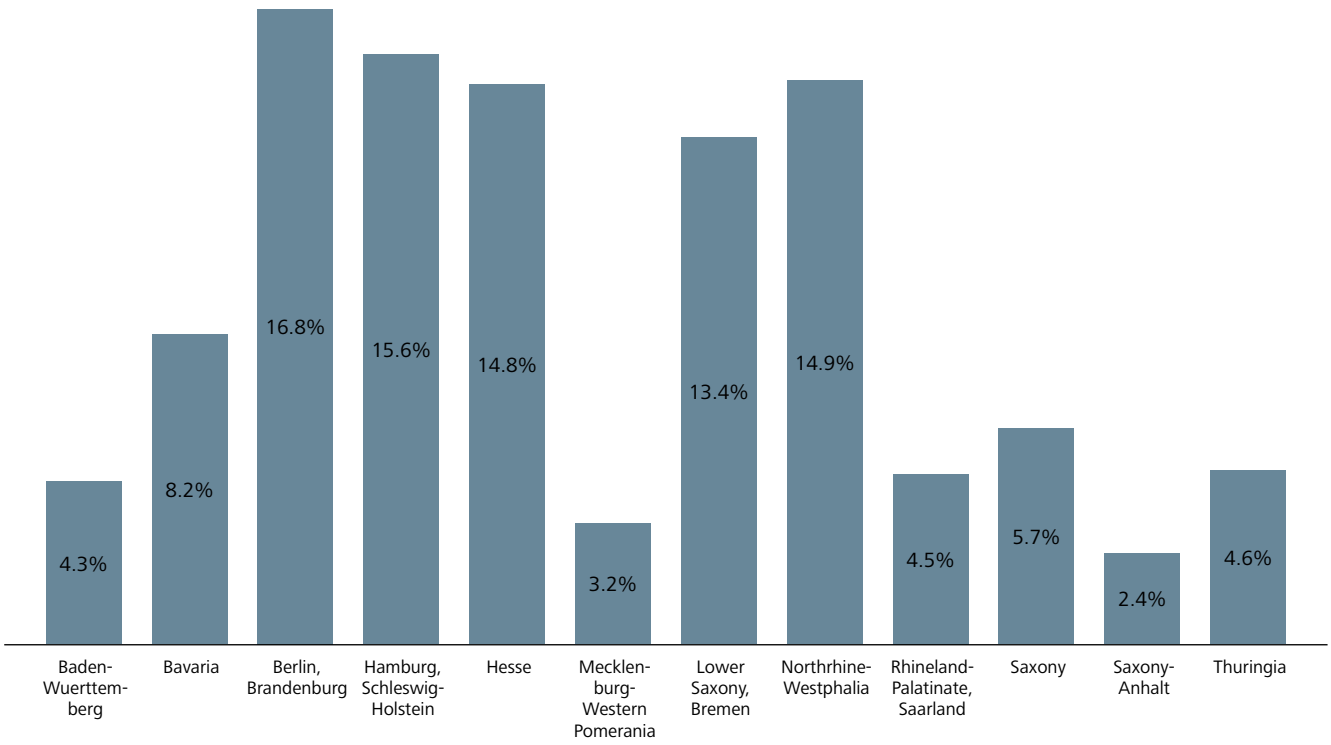
Integrated network for all broadcasting contents?

In line with the tendency of seeing the digital world initially as a mirror image of the analogue era, separate developments for the transmission of radio and television respectively were set in motion despite the fact that from a technical point of view, transmission of a media is only a matter of the data rate. Not being geared to TV channels, DAB benefits from the smaller-size multiplexes required. On the other hand, developments in Germany show that there is no sufficient basis for funding a transmission network based mainly on radio.

This would call for making better use of synergies not only involving DTT and DVB-H, but also certain forms of broadcast transmission and internet use. In this respect, however, the transmitter network owned by ARD represents a core obstacle as it is devised for traditional broadcast transmission and thus does not provide any incentive for opening up new forms of synergy or new business options.

DTT penetration in the German states

TV households, in million



Basis: 37.277 million TV households in Germany Source: 2008 Digitisation Report

Panasonic TU-CT20

The digital dividend

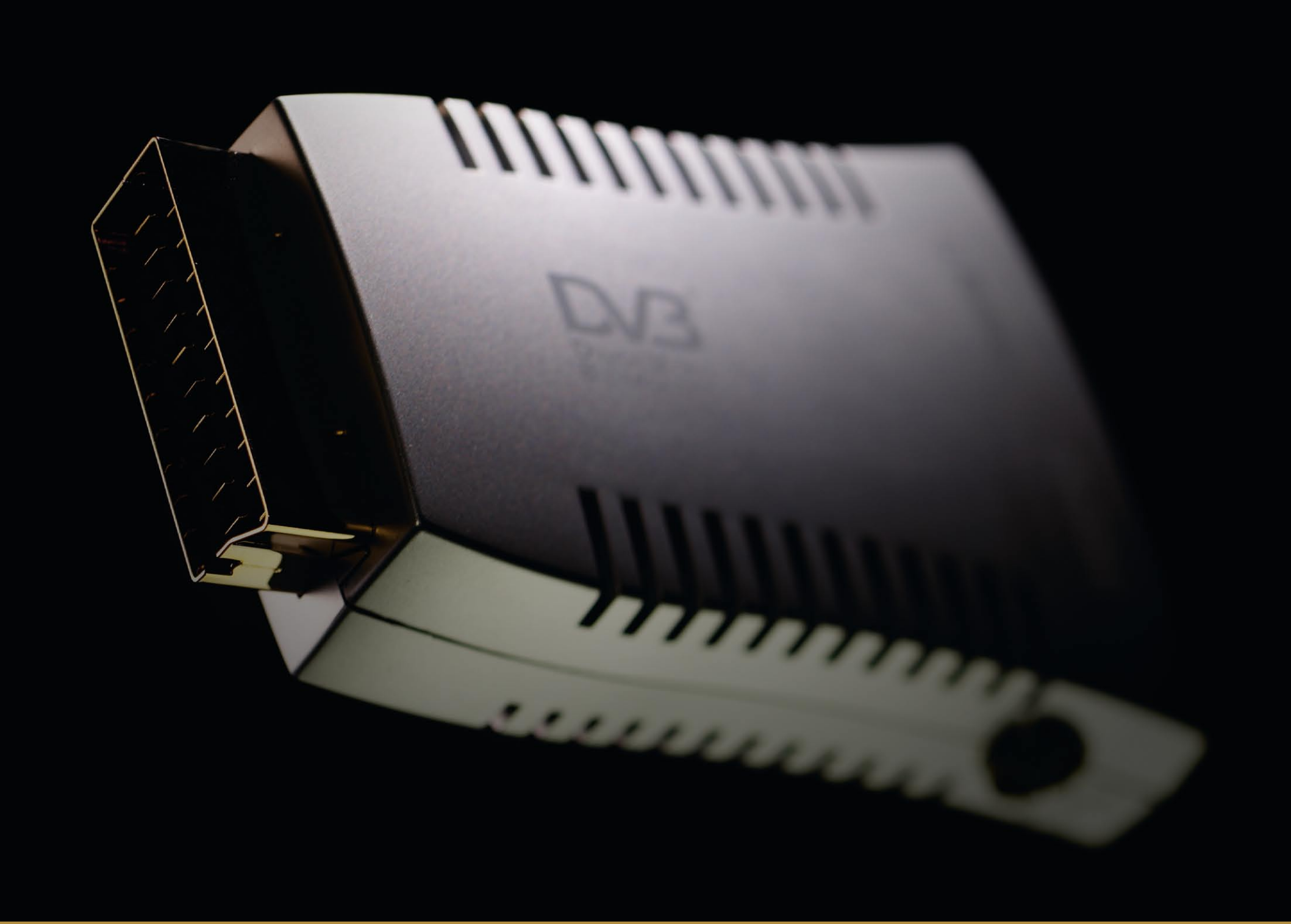
LG HB620T

More TV services

Looking back at developments so far, the lack of attention paid to the value of frequency capacities in Germany in the run-up to the switchover in Berlin-Brandenburg appears quite stunning; this contrasts strongly with the interest in spectrum which exists in the USA and the UK. And although the auctioning process of the 3G capacities brought a record Euro 50 billion plus to the tax office, broadcasting spectrum was not rated similarly for its value at the time. The two worlds were still clearly separate back then. What helped mabb to convince broadcasters of the use of analogue switch-off was more an inkling of its future value.

The easiest option at the time would have been "Wait and see"; however, it would have foreclosed the opportunity of participating in any forthcoming distribution of transmission capacities. All parties involved were aware of the fact that in the future, new functions would be at stake which would be largely dominated by mobility as the sole distinguishing feature of terrestrial transmission over all other routes of broadcast distribution. Mobile broadband internet at the time was as far away yet as was TV consumption on mobile phones.

Since clearly-defined options for use for other purposes were lacking, planning the future use of transmission capacities was left solely to the broadcasting sector. The advantages offered by digital transmission were put to use for offering additional services which were already available via cable and satellite; they presented the sole feature for keeping terrestrial transmission in the game. This strategy also provided the financial basis for continued transmitter network operation.



Imperial T1 Digitale DVB-T Scartbox

Mobile television

DTT was not designed for mobile reception. During the DTT project, DVB-H was coordinated which offers two major improvements over DTT: It features a more robust reception requiring less power and was devised to make TV available on handhelds.

The mobile industry initially saw DTT only as a complement to the transmission of moving images in mobile telephony standards such as 3G. These point-to-point connections involve considerable cost for the distribution of contents in simultaneous demand by a large audience, and are not sufficiently efficient.

In February 2007, the first digital dividend was made available in Berlin for test purposes on channel 39 which had previously been used by public-service broadcasting.

However, development was slowed down as there was no sufficient basis for the provision of receivers and content as had been the case in the DTT switchover in Berlin-Brandenburg. The mobile industry did not wish to conduct a market test but opted for immediate national introduction, having, in return, to contend with a complex consultation process under the Federal broadcasting structure. Meanwhile, trials also started with DMB as an alternative transmission standard. This brought some additional experience, but insufficient transmission capacities and the lack of support on the part of the mobile industry prevented the standard from establishing itself successfully in the market.

Regarding DVB-H, it proved more difficult to define any additional value for consumers from the start which would have been necessary to refund the required receivers, and this problem persists. The fact that DVB-H would be available for reception on handhelds from the start, allowing for billing and offering a subsidy system which had been developed by the mobile industry, presented an advantage. The potential entry barrier was therefore lower than for DTT. This did not, however, solve the second challenge: convincing consumers to take out a subscription. As with digital cable and digital satellite, it is quite difficult to get consumers to pay for contents which are also available free of charge. Unlike in the approach pursued in the Far East, mobile TV in Germany was based on pay.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Nokia 770

Broadcast spectrum for broadband internet in rural regions – overcoming the digital divide

Switchover and the changing function of terrestrial transmission

The significance of digital terrestrial transmission for television today differs fundamentally from its relevance in the 1970s and 1980s when TV was only available through the air. Today, cable and satellite present the major routes of transmission, while IPTV is also beginning to make headway via broadband telephony networks. The public-service broadcasters in Germany are no longer required to supply their TV services via terrestrial transmission to the entire population. Employing DTT, their coverage (roof antenna reception) is approx. 90 per cent of viewers compared to the former full supply. The commercial broadcasters transmit their services via DTT only in the centres of population. DTT is gaining in relevance for reception via the second and third sets and for mobile reception including TV on mobile phones. As a consequence of the high cost of transmission, rural regions are supplied far less well; acceptance is specifically low in areas where no commercial channels are available via DTT.

Planning mobile TV via DVB-H is focusing even more on the centres of population than was the case for DTT; whether the necessary additional infrastructure can in fact be funded from subscriptions paid by subscribers is presently unclear. The 16 channels are to be used mostly for contents which are available free of charge via other routes already.

Broadband internet and broadcasting

Broadband internet which in Germany is transmitted mostly via DSL and is now increasingly also offered via cable, is gaining in relevance for broadcast transmission. The libraries of the public-service providers permit contents to be watched at the time chosen by the viewer while online services link video, audio and text. The latest study conducted by ARD and ZDF on online use shows that 14-19-year olds spend about the same time surfing the world-wide web as they listen to the radio or watch TV. Mobile phones provide contents such as "Tagesschau in 100 Sekunden" (the ARD main news in 100 seconds) around the clock while the news broadcasts transmitted via the DVB-H channels are usually available only once an hour.

Broadband internet today presents a source of information access to which is considered a basic right for citizens. Article 5 of the German Constitution in its first section warrants the right of citizens to inform themselves via generally accessible sources. In the early years, making television available everywhere at any time was a public requirement of the first order even if it involved particular expenditure in rural regions, access to broadband internet must now also be prioritised as a prime means of communication as well as a basis for economic activities.

Digital divide – rural regions at a disadvantage

In rural regions as well as in some city outskirts, access to DSL is not available or is lagging far behind. In many instances, cable does not offer an alternative. Broadband internet is available via satellite, but this mode of transmission has met with only limited acceptance. The last spectrum auction for broadband internet access in the 3.5 GHz range did not yield the improvements for rural regions that had been hoped for as the infrastructure needed there cannot be built up at economic terms. The main reason for this is the frequency spectrum.

Broadcast frequencies and the internet

Employing broadband frequencies would permit radio networks for internet access in rural areas to be set up at less expenditure than in the typical frequency range as the transmitters used allow for wider coverage and the frequencies are also particularly suited for indoor supply.

Bi-directional radio networks for broadband internet, however, differ fundamentally from traditional broadcast supply which is based on high-power transmitters broadcasting in one direction towards receivers designed to show the entire range of frequencies. Bi-directional networks for broadband internet reception by contrast are constructed in a cellular structure comparable to mobile radio networks with transmission being effected in predetermined frequency bands which are aligned to the receivers and transmitter systems.

As long as parts of the broadcast spectrum are not allocated to other services ("sub-band") as the European Commission plans to do, the simultaneous use of spectrum for broadcast and broadband internet can result in interference for either. However, there is no practical experience thus far as to what extent such interference would impact on the advantages presented by broadcast spectrum being employed for internet transmission and what measures could be taken to limit it.

Pilot project in Brandenburg

With the pilot project planned in Brandenburg, mabb intends to gather information on these issues, thereby providing a basis for future frequency planning and for establishing the actual capacity needs of broadcasting and broadband internet. The pilot project will not solve the current problems in the supply of rural areas as it focuses on technical questions, but it is intended to contribute to their solution involving broadcast spectrum in the future.

The interests of the mobile industry

The 3G auction was conducted at a time of growth when euphoria for the internet was on the increase. But there were no clear ideas what was to be done with the spectrum.

Today, growth regarding the number of potential consumers has almost come to a standstill. And while the development of broadband technologies is advancing, the fixed-line networks show that voice telephony is being reduced to a minor role in regular operation. As regards mobile applications, the internet offers just about everything from TV to telephony. The borders between fixed-line and mobile networks are becoming increasingly blurred in use: contents downloaded at home for cost reasons can be put to mobile use on the road.

The telecommunications industry is seeking to balance the loss of revenue it suffered in its transmission operations by marketing contents ranging from TV to new options of use provided by the internet. Attempts to build up an individual profile in a separate world ("walled gardens") have not yielded much success as yet when compared to the dynamics characterising the internet.

As spectrum auctions in the USA and the debate concerning the so-called" white spaces", i.e. spectrum available for use in regional areas, prove there are new players who pursue their own interests: cable operators intending to enrich triple play with a mobile version, or Google demanding open access to the frequency spectrum for all receivers.

The telcos are far superior to broadcasting when it comes to economic clout and presenting perspectives for the (efficient) use of spectrum. This does not, however, mean that they really do have very clear-cut ideas for the future use of these additional capacities. What is evident is the interest in protecting one's own perspectives and limiting competition – just as the dominating broadcasters in the analogue world did not exactly welcome the new competition which digitisation brought along.

The frequency spectrum allocated for mobile telephony is clearly sufficient, and as regards telephony, a sensible regulatory objective should involve opening up choice for consumers among the various operators. Broadband internet requires far more capacity which – even if utilised more efficiently – raises the question as to the number of networks that can be built up in an economic way. This question is not new by any means: It is already an issue today regarding other infrastructures such as broadband cable networks, and requires appropriate answers on the part of regulation, for instance concerning the issue of access to a joint infrastructure for different providers.

The specific value of broadcast spectrum for rural regions

The advantage offered by the greater coverage which is possible using broadcast spectrum would lower the infrastructure costs for rural regions.
It does not come into play in the same way in the major centres of population: Supplying a large number of consumers necessitates sufficiently small cells for which spectrum in the higher band areas is suitable with the reduced risk of interference adding a further benefit.

This would speak for an approach under which broadcast spectrum is initially released for rural regions but not for cities where DTT and DVB-H are built up and consequently less spectrum is available. Besides, the old mistakes should not be repeated which were made in the telecommunications policy and the allocation procedures conducted under media legislation before under which the supply of rural areas would be welcomed but cannot be practically realised as the industry is concentrating on the big conurbations for financial reasons.

However, an interesting approach for the major cities might be to release spectrum currently allocated to broadcast transmission in a similar way for general applications as this is happening successfully for W-LAN networks. If the interested industry can in fact develop receivers which would exclude interference with sufficient likeliness, these could also be used in Germany.

Nokia E71

The German way to the digital dividend

Broadcasting must go into the internet, too!

Germany has the opportunity to develop a concept for the utilisation of the digital dividend taking the national specificities into consideration rather than waiting for central provisions as they are currently being developed in Brussels. Germany planned analogue-digital switchover long before the European Commission took up this issue.

However, there has not yet been a clear and open debate in Germany concerning the digital dividend. The frequency planning by public-sector broadcasting as well as by the technical experts of the regulators was focused on claiming the entire frequency spectrum available in the wake of 2006 World Radiocommunication Conference(WRC-06) for the broadcasting sector. Enquiries of the Federal Network Agency were initially fended off, the concrete use was not touched upon. Now, however, the significance of the internet also for broadcasting is being increasingly recognised, and this could provide the chance to achieve a reasonable balance of interests.

The German situation concerning the utilisation of broadcast spectrums opens up specific opportunities for broadband internet transmitted via broadcast capacities. Unlike in other European countries, the commercial broadcasters in Germany never achieved full terrestrial coverage of the country, and public-service broadcasting is also less dependent on terrestrial transmission than is the case elsewhere in Europe. Neither public-service nor commercial broadcasters have developed any plans for HDTV transmission via terrestrial frequencies. The rural regions are supplied via satellite without any extra cost while satellite transmission in most other countries takes the form of pay-TV.

Time to get going is limited. The rural regions cannot and must not be kept waiting until frequency bands become available under any European or global capacity coordination procedure. But it might be possible to make use of global synergies, especially regarding receiver design as they might, for instance, result from the employment of broadcast spectrum for internet transmission in the USA.

Capacity coordination between the Federal and state levels

Broadband internet requires Federal government and the German states to cooperate in a new way. Traditional telecommunications law and broadcasting legislation are based on a clear distinction of the use of spectrum for either broadcasting or other uses. Capacity requirements for broadcasting are determined by the German states which have far-reaching co-decision powers in this respect while they have no say regarding other frequency uses.

Telecommunications law in Germany is geared along the terms of narrowband voice telephony. Broadband internet now allows for the transmission of both broadcast contents and telephony along the same route of transmission. Access of citizens in rural regions to broadband internet serves broadcasting but also represents an elementary interest of the states in other respects.

The balance of interests concerning the supply of consumers with DTT on the one hand and broadband internet on the other hand can only be reached if Federal government and the states cooperate. Separating broadcasting from non-broadcasting applications will not bring this balance about.

New objective for frequency planning

The German states and the regulators can contribute to the frequency capacities being employed more efficiently by readjusting their planning. Traditionally, planning aimed at full coverage with both public-service and commercial TV channels, with corresponding applications for demand being filed by almost all states. The actual use of capacities, however, considerably differs from the applications filed, especially as far as commercial television is concerned. As a result, there is some scope for employing spectrum for broadband internet use.

The new alignment of frequency planning must contribute to defining a preferential range of frequencies for broadband internet for Germany, taking into account international developments, and to promoting its utilisation even where this results in changes to the current use of capacities for DTT transmission. In this process, the current supply must be maintained.

Apple iPhone

Balancing the interests must not be left to those parties whose particular interests in maintaining existing transmitter networks might lead them to a hesitant approach towards changes, i.e. the mobile industry, but also the ARD stations operating their own networks.

In the broadcasting sector, the public interest concerns the contents transmitted both via DTT and via broadband internet. For this reason, responsibility within the broadcasting corporations must lie with those in charge of contents and strategy rather than with the technical departments.

New objectives for procedures under telecommunications law

The procedures for determining the operators providing broadband internet under telecommunications law must be devised to meet the requirements for the supply of rural regions. To date, the highly-populated areas have benefitted most from the procedures in force.

The competitive approach of network operators utilising separate infrastructures which was developed in the field of voice telephony should be reviewed regarding its suitability for broadband internet supply: The necessary bandwidths probably allow for a limited number of networks only. It is therefore all the more important to assess all models proposing a jointly used infrastructure (as in DVB-H planning) or any access regulation which would be the obvious solution concerning the structure of the internet anyway. The separation of networks and uses is more relevant today than ever before.

Pragmatic solutions rather than debates for the sake of principles

As little as broadband internet can be qualified as broadcasting in the traditional sense, can this be claimed for mobile radio. Mobile radio for voice telephony does not require a digital dividend. Progress of technology is breaking down the barriers that existed between fixed-line and mobile networks in the same way as they are disappearing between broadcasting and mobile radio.

As attractive as the debate of the issues raised by these developments may be, priority should be given to developing pragmatic solutions allowing for the use of broadcast spectrum for the supply of rural regions. The experience gained in this process may then be put to good use for advancing telecommunications and broadcasting legislation.

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